"OBSERVATIONS ON WOUND TREATMENT

BY MEANS OF EUSOL

WITH SPECIAL REFERENCE TO THE METHODS OF

CONTINUOUS IRRIGATION AND LAVAGE"

BY

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OBSERVATIONS ON WOUND TREATMENT BY MEANS OF EUSOL WITH SPECIAL REFERENCE TO THE METHODS OF CONTINUOUS IRRIGATION & LAVAGE.

BY JAS. B. HOGARTH, M.B.,Ch.B. Ed. Capt. R.A.M.C. (T).

In medicine as in other branches of science the present great war has acted as a stimulus to research and invention and in no department of medicine has this been the case more than in the treatment of septic wounds and processes. For a considerable number of years before the war this subject seems to have attracted little serious consideration. The improvements in methods of securing asepsis have been to a large extent accountable for this apparent neglect, inasmuch as surgeons were able to perform extensive operations with little fear of the wounds becoming septic. The necessity, however, of preventing sepsis on the field and afterwards of combating it in hospital has produced a wealth of suggestion regarding methods to be adopted in preventing, overcoming, or modifying septic infection of wounds.

In view of the failure of iodine as a field antiseptic and as a result of the inadequacy of carbolic acid, both as a lotion and as an ointment, to counteract septic processes in wounds, it became a matter of the utmost necessity to discover an agent which would efficiently prevent or control wound infection.

As the result of a request by the Medical Research Committee that/

that a special investigation with this aim should be made in the medical schools, Professor Lorrain Smith and his colleagues in the pathological laboratory of the University of Edinburgh concentrated their efforts towards the discovery of such an agent.

The result of their investigations was to draw attention to the potency of chlorine and its derivatives, and in a communication to the B. M. J. of July 24th 1915 entitled "Experimental Observations on the Antiseptic Action of Hypochlorous Acid and its Application to Wound Treatment" they announced that they had been able to discover an antiseptic which was likely to prove effective. Their experimental work proved that hypochlorous acid was not only a powerful antiseptic but that it posseased the great additional advantage of being non-injurious to the tissues.

Already the wide use accorded both in civil and military practice at home and abroad to the solution of hypochlorous acid, known now as Eusol, says much for its success in fulfilling requirements.

In the Summer of 1915 while acting as resident surgeon to Mr. Miles in the Edinburgh Royal Infirmary I had many opportunities of using and seeing it used extensively and was so much impressed by the successful results obtained both in civil and military cases that I became a firm believer in its efficacy. The experimental work which was carried out in connection with its discovery/

discovery had proved that it was a powerful antiseptic and it now became desirable to find out the best methods of using the solution.

Both in Edinburgh, through the courtesy of my chief Mr. Miles, and afterwards whilst holding a similar appointment in the Derbyshire Royal Infirmary under Mr. Southern and Mr. Hicks, I was afforded every facility for trying different methods and forming an estimate of their relative merits in wound treatment. At first I used the solution cold but with further experience found that better results were obtained when it was used in a warm state. This is quite a rational conclusion as it is invariably the case that chemical reaction takes place more quickly and completely in the presence of heat. Hence we may well suppose that the germicidal power of Eusol will be increased when it is used warm.

METHODS OF USING EUSOL.

The following are the various methods which I have employed in treating septic wounds with Eusol. -

I. As a simple lotion or in conjunction with 10% saline.

II. As a gauze compress.

III. As a fomentation.

IV. As a bath.

V. By means of an apparatus for securing continuous irrigation

VI. By means of an apparatus for securing continuous lavage and drainage.

VII. By means of gauze plugs used alternately with a solution of Potassium Iodide of a strength of 40%.

I.

AS A SIMPLE LOTION OR DILUTED WITH AN EQUAL QUANTITY OF 10% SALINE.

The wounds treated by the above means were chiefly those of a more or less superficial character in which suppuration did not tend to become excessive and in which it was unnecessary to resort to more prolonged application. These wounds were simply bathed with the warm lotion, perforated oiled silk protective being placed round the edges and sterile gauze then applied. In all instances of the cases treated in this way the process of wound granulation was perfectly satisfactory, the wounds possessed all the characteristics of healthy healing sores, their surfaces did not bleed too readily, nor was there any tendency for the granulations to become superabundant or œdematous. In three cases, where the raw surface was very extensive, skin grafting was resorted to and the grafts in all cases adhered and grew readily. As regards its effect on epithelial growth I have not observed that there is either retardation or stimulation.

II.

AS A GAUZE DRESSING WITHOUT WATERPROOF.

This method has been chiefly adopted after the septic process has been thoroughly brought under control by means of fomentations/

fomentations, and is excellent as a means of keeping it in check. After a time the dressings are apt to become dry but the application of the antiseptic is of sufficiently long duration to keep the wound clean. Moreover, as the granulations are apt to become rather oedematous after continued fomenting, evaporation of moisture from the wound is by this means facilitated and the above mentioned condition favourably influenced.

III.

AS A FOMENTATION.

I have been in the habit of treating all foul, freely suppurating wounds with wet Eusol dressings and have in several instances resorted to this treatment in wounds of an extensive nature which have resulted from accidents. The object of treating the latter in this manner was to prevent the occurrence of sepsis and in every case I found it to be perfectly efficacious. In the former cases where sepsis was present in a marked degree, and the patient's chart often showing a swinging temperature, I have very frequently noted a rapid and permanent subsidence of feverish symptoms, both as indicated by the chart and the general condition of the patient. In no case had the patient been taking any fever reducing medicine. In cases also where the suppurative process was associated with foetor the latter was rapidly eliminated. It is interesting to note that while the wound discharge/

discharge undergoes approximately the usual alterations in character, the process takes place by more rapid stages. At first of a creamy consistency the pus in a few days becomes thinner, clearer and more scanty, indeed more like lymph. Thereafter it again alters its character and becomes sero-sanguineous. This latter phenomenon may be explained on the grounds that after continued treatment with Eusol the granulations assume a deeper red colour than usual. It is probable that this is due to the penetrative property of the antiseptic and its effect in reducing hæmoglobin. Its action in altering hæmoglobin can readily be observed when a bleeding wound is being cleansed with the solution, the blood quickly assuming a greenish colouration. I have not had the opportunity of examining the spectroscopic appearances of blood so acted on but such an observation would doubtless prove interesting. As soon as the discharge becomes like blood-tinged serum I usually discontinue fomentations and employ wet gauze dressings.

I am convinced that where sloughs are present in the wound their separation takes place more quickly under the influence of Eusol fomentations than they do when similarly treated by boracic acid.

I have found that when the fomentations were first applied the patients occasionally complained of a smarting sensation, but this was of short duration and on the whole there was little if any discomfort. The amount of skin irritation produced by the/

the continuous application of Eusol fomentations even for several days is almost negligible, though there may be, as one might expect, some tendency towards œdema of the granulations

The power of the antiseptic in preventing the occurrence of sepsis is well illustrated by a case which I treated with Eusol fomentations. -

The patient, a man of sixty years of age, was admitted to Hospital on March 2nd 1916 suffering from a compound fracture of the olecranon process of the Ulna involving the left elbow joint.

The history of the injury was that he had slipped and fallen on a paving stone, and in falling had borne the weight of his body on his left elbow. The wound had bled freely previous to his admission. On examination the wound was found to communicate with the elbow joint inasmuch as the Olecranon process was comminuted. A triangular flap of skin was also raised from the wound surface, its base of attachment being upwards.

The patient was at once anæsthetised, the comminuted pieces of the Olecranon and small portions of tissue likely to slough were removed, the joint cavity syringed thoroughly with warm Eusol and packed lightly with gauze soaked in the solution. The arm was then put up on a right angled splint.

Dressing was carried out daily in the above manner. The wound never shewed any sign of sepsis from the day of patient's admission/

admission to that of his discharge. The four-hourly chart indicated slight rises of temperature above normal for three days subsequent to his admission and thereafter, until the date of his discharge on March 30th. 1916, remained consistently below normal. On the twentieth day the wound communication with the elbow joint being closed and the granulations on the base of the wound and on the skin flap being abundant and healthy in appearance, the skin flap was then sutured to the wound edges and complete healing took place by third intention.

Three weeks after his discharge from Hospital I saw him in the out-patient department, and at that time he had a normal range of movement unaccompanied by any pain.

As illustrative of its power to overcome septic infection of a very virulent type I may cite the case of a female patient who was admitted to hospital suffering from a rapidly spreading phagedenic ulceration of the right breast. The patient, who had been nursing a child, gave me to understand that a week previously a papule had developed just below the nipple and within the areolar area. It was very painful, and later, becoming pustular, it burst. The process of ulceration then spread rapidly so that on admission the whole of the right breast was involved. When admitted she was highly fevered, the temperature being 103.4°F., Eusol fomentations were applied every four hours at first and from the commencement of the treatment/

treatment the ulcerative process was checked: within a week the temperature fell to normal and the raw area showed healthy and active granulations. Epithelial ingrowth was also manifested. The very extensive raw area was then skin grafted with highly satisfactory results. The history of the infection and the spread of the ulcer seem strongly indicative that this was a mixed infection by the bacillus aerogenes capsulatus and the streptococcus.

IV.

AS A BATH.

When treating wounds with a Eusol bath I have always used the solution at full strength, the temperature being about 110°F. The patient is treated in this manner once and sometimes twice a day, according to requirements, the duration of the bath being about an hour and the patient finding this quite a pleasant form of treatment. The period of exposure in the bath might with advantage have been prolonged but though I have not tried this form of treatment very extensively the results were such as to justify it fully. I may add that when a solution of the above temperature is used, no renewal of the solution is necessary during the exposure.

In/

In view of their situation, wounds of the hand, forearm or foot are specially suitable for this mode of treatment.

V.

BY MEANS OF AN APPARATUS FOR CONTINUOUS IRRIGATION.

The method of applying continuous irrigation, as about to be described, was first used in the Edinburgh Royal Infirmary in the Summer of 1915 by means of an apparatus which I devised for this purpose, while acting as resident surgeon to Mr. Miles. It is quite simple in its construction and method of working, and in its general applicability can be used in practically all kinds of septic wounds, though for preference I think that it is best adapted for large open wounds of some depth. The method insures a continuous flow of the fresh warm antiseptic into the wound, and by diluting the wound discharge, aims at securing at the same time more complete drainage.

The following is a short description of the apparatus together with a few notes on its method of preparation and mode of working, and accompanying is a diagram for purposes of illustration, by which it will be seen that its action consists in a simple practical application of the principle of capillary attraction. The articles enumerated below are necessary for its construction. -

(1)/

(1) A glass bottle with a wide neck, and with a capacity of about 6 oz.

(2) A tightly fitting cork.

(3) A piece of V-shaped glass tubing with a calibre of about $\frac{3}{8}$".

(4) Three feet of rubber tubing with a calibre of about $\frac{1}{4}$".

(5) A ball of spirit lamp wick, the fibre of which should not be too fine as otherwise it will be more readily destroyed by the Eusol solution.

(6) A short length of thin iron wire.

(7) A silver probe with an eye.

(8) A set of cork borers.

(9) A glass spool.

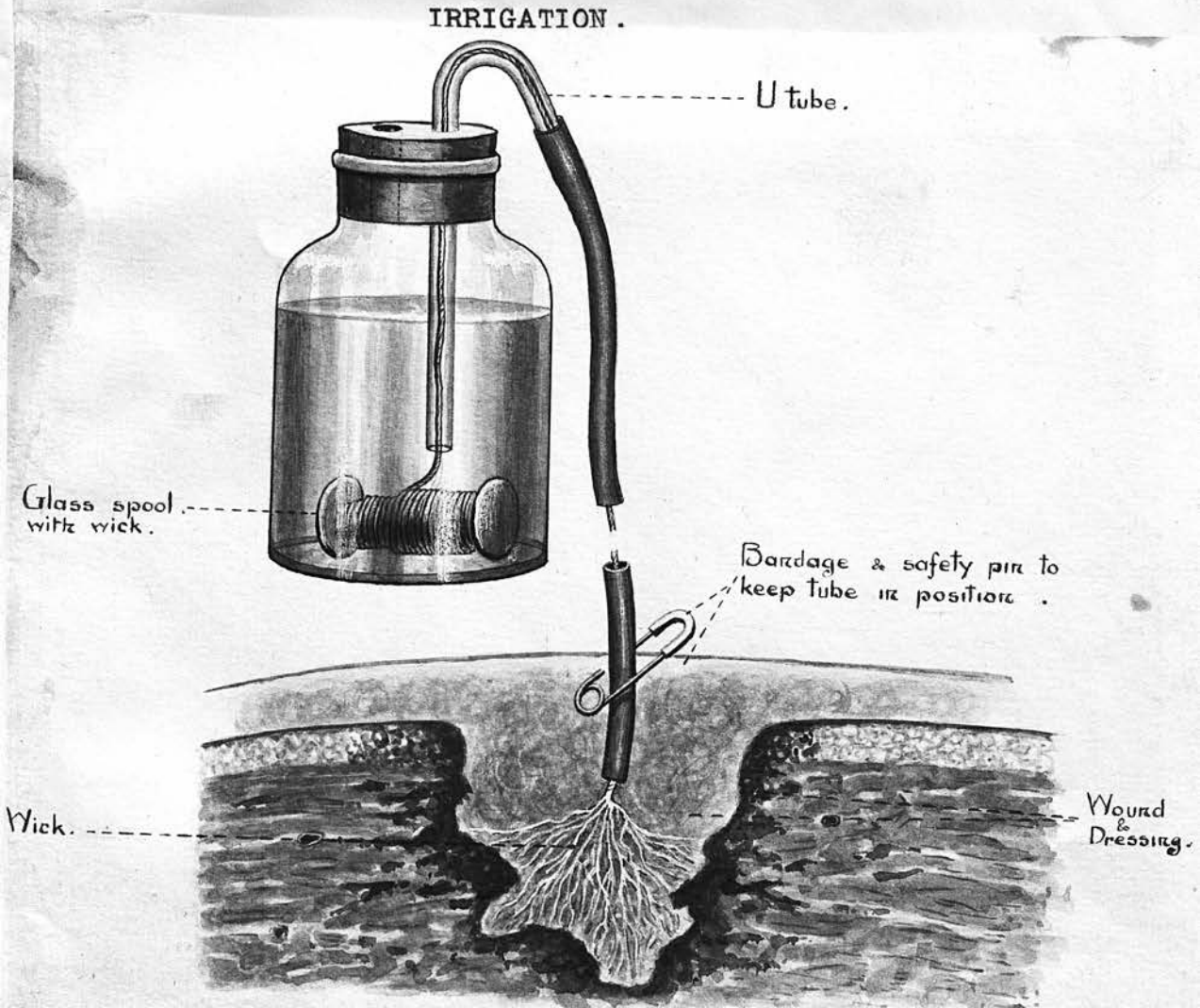
MODE OF PREPARATION OF APPARATUS.

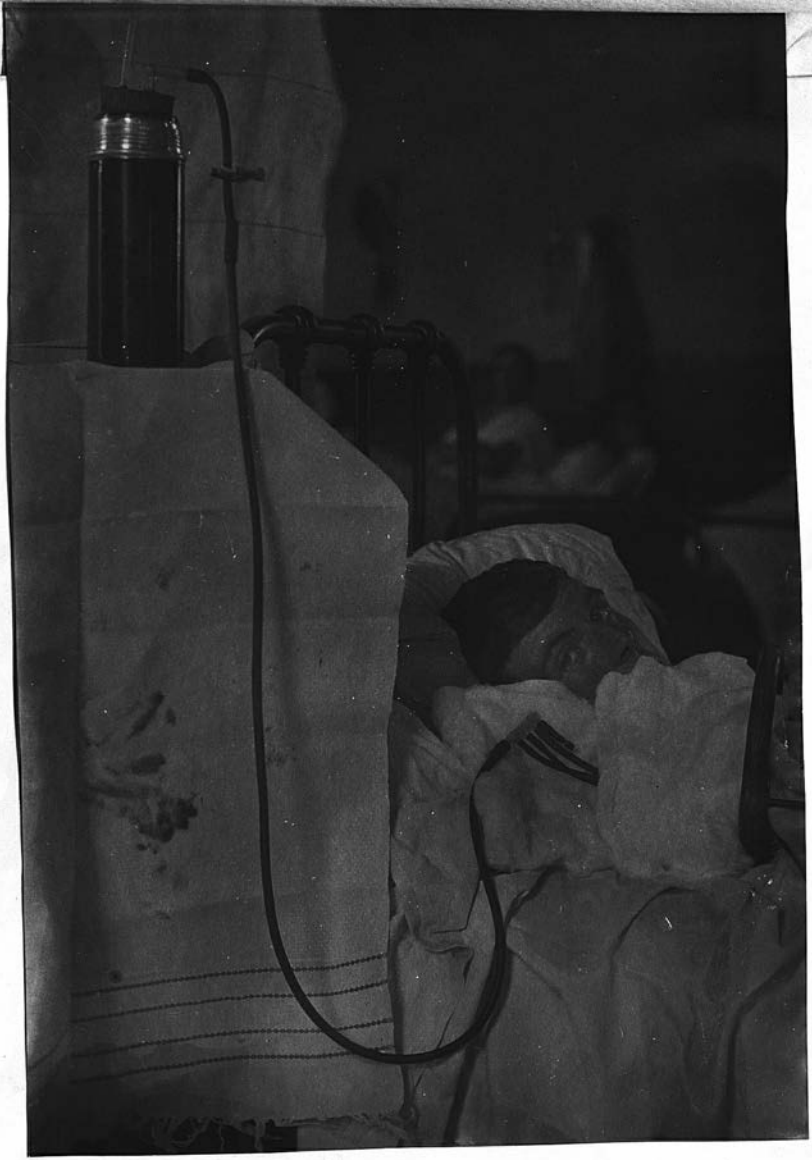
A hole of suitable size to admit the V tube is first bored in the cork, and another which remains vacant in order to secure equalisation of air pressure. A piece of glass tubing with a calibre of about $\frac{3}{8}$" is then bent into the form of V and the ends rounded in the flame, the latter process being performed to prevent cutting or fraying of the rubber tube. Having inserted the V tube in the cork, we take the glass spool and winding round it a sufficient quantity of spirit lamp wick as a reserve, we leave free a length of about four feet.

Now/

Now take the iron wire, pass it downwards through the V tube, fasten it to the free end of the wick and draw it through. Detach the wire, thread the eye of the probe with the wick, and it is now a very easy matter to pass the wick through the whole extent of the rubber tubing. Lastly fit the rubber tubing over the end of the V tube, fill the bottle with Eusol, place the spool in the bottle and the apparatus is ready for use.

DIAGRAM OF APPARATUS FOR CONTINUOUS IRRIGATION.





METHOD OF USE.

I have used the apparatus as above described in a great variety of septic wounds both on the military and civil side of surgical practice and the results have been most encouraging. Among the cases so treated may be mentioned ordinary flesh wounds, cases of acute appendicitis with abscess, and compound fractures, and almost without exception they did better under this form of treatment than by ordinary dressings with Eusol, and indeed before having recourse to continuous irrigation some of them had previously been treated with Eusol fomentations If the best results are to be obtained there are certain points in connection with the use of the apparatus that should receive attention. The first is that the solution should be kept warm. This can easily be secured by placing the bottle in a bowl of water at a temperature of about 120°F. This is good enough for all practical purposes as it does not necessitate that the water in the bowl should be frequently changed. In order to secure a uniform temperature of the solution in the reservoir I have recently made use of a Thermos flask and find that it answers the purpose admirably. The second point is that the reservoir should be situated at such a height above the wound to be treated that the drop rate from the wick should not exceed about 10 drops per minute, otherwise the dressings will become unnecessarily wet, which it is desirable to avoid, both from /

from the point of view of comfort to the patient and extra labour from the nursing staff. Further, the wick should be placed well over the surface of the wound, or in the case of a deep wound, towards the bottom of it. When treating a deep wound by this means it is advisable that a gauze dressing should be packed lightly into it as in this way much better drainage is obtained. Pressure on the tube and any tendency to its withdrawal from the wound may be prevented by the use of a cage, and indeed I have often found it most convenient, especially in treating appendicular wounds and those of the lower extremity, to suspend the reservoir from the top of the cage. If this be done there will then be no need to keep the solution warm as it must always approximate closely to body heat before it reaches the wound surfaces. The many tailed bandage loosely applied is useful in keeping the tube in the wound or amongst the dressings. After the apparatus has been in action for some time, and especially if the wound under treatment is very septic, it may be noticed that the solution is not flowing satisfactorily. This will almost invariably be found to result from saturation of the wick in the wound and in the lower end of the tube with pus, and consequent interference with capillary action. When the irrigation is thus interfered with it is a simple matter to remove the tube from the wound, pull down the wick and cut off the part which has become blocked.

After having carried out this treatment continuously for three/

three or four days I have occasionally noticed an erythematous condition of the skin in the region of the wound, which in its features much resembles a scarlatinal rash, but have never observed it to be accompanied by any constitutional disturbance, nor did it ever extend. The reddened area was not sharply demarcated nor had the rash the fiery red appearance of an erysipelas and it is probable that it was due to irritation produced by the Eusol solution. When any tendency to this condition is noticed round the wound edges its further spread may be cut short by the application of sterile vaseline to the skin in the region of the wound. In no instance have I observed a severe degree of skin irritation except in the case of an old man suffering from an extensive cellulitis of the left thigh, and this would not have occurred had proper prophylactic measures been adopted. In his case the symptoms of irritation rapidly subsided on the discontinuance of the treatment for a few days. In several instances of appendicular abscess treated in the above manner it has become apparent that the bacillus coli infection, which so often produces a copious flow of pus about the 5th, 6th and 7th days, has been considerably modified. I have used Eusol alone in its full strength in nearly all cases treated by this method as it was found that, when used along with 10% saline, the discharge became, not exactly viscous, but rather of a mucoid consistency, so that free drainage was not obtained. When continuous irrigation is adopted in the treatment of foully smelling suppurating wounds it will be found that foetor/

foetor is rapidly eliminated, a result highly desirable of attainment.

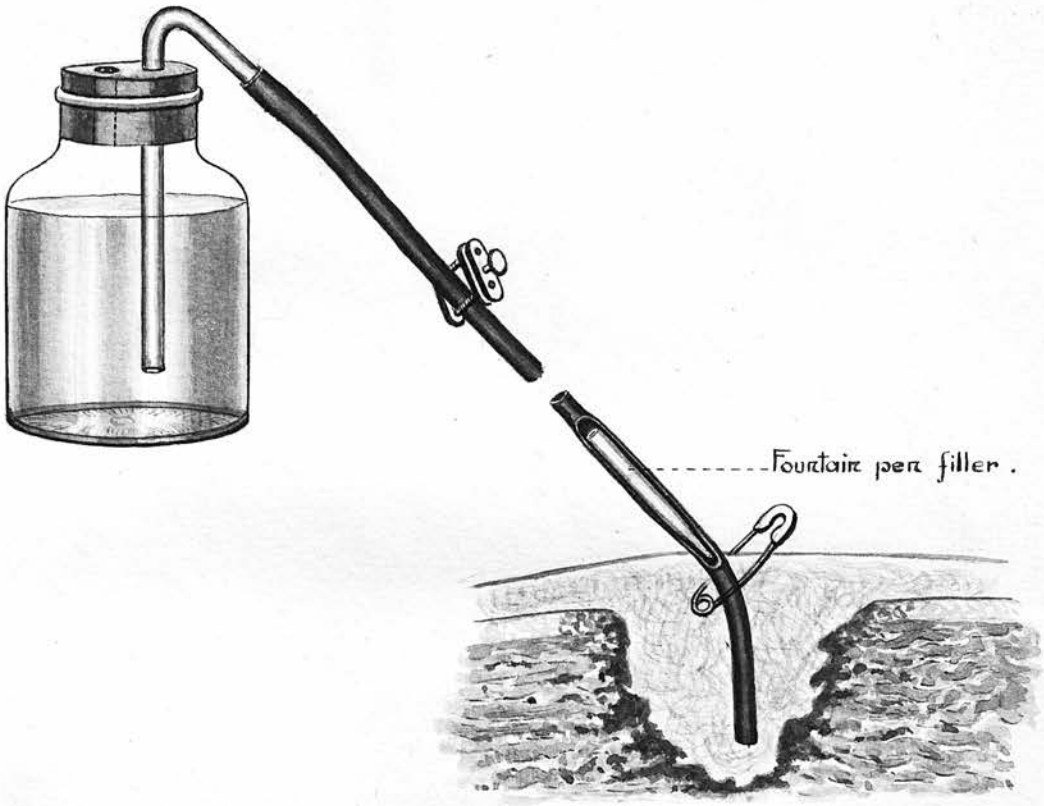
ALTERNATIVE FORM OF APPARATUS.

Following a suggestion made by Mr. Cathcart that a modification of the above described apparatus involving the application of the principle of the syphon might be used, I constructed a modified syphon as ~~illustrated and~~ described below.

We have as before a wide necked bottle fitted with a double channelled cork, glass V tubing, all similar to those before described, except that the V tube reaches to the bottom of the reservoir. A glass nozzle is fitted to the end of the rubber tube, a fountain pen filler doing admirably for this purpose: above the attachment a screw clamp is fixed to control the rate of flow, and a short length of rubber tubing for insertion in the wound is attached to the end of the nozzle. The syphon action may be conveniently started by exhausting the bulb of a Klapp's suction bell and attaching its rubber tube to the end of the glass nozzle, from which a fine stream then issues. The desirable drop rate can be obtained by tightening the screw clamp. The rubber ending for insertion in the wound is then attached and the apparatus is ready for use.

(For diagram - see over).

DIAGRAM OF SYPHON FORM OF APPARATUS.



By releasing the screw clamp a wound can be readily flushed out, and, if it be desired, the glass nozzle provides a useful spray while performing a dressing.

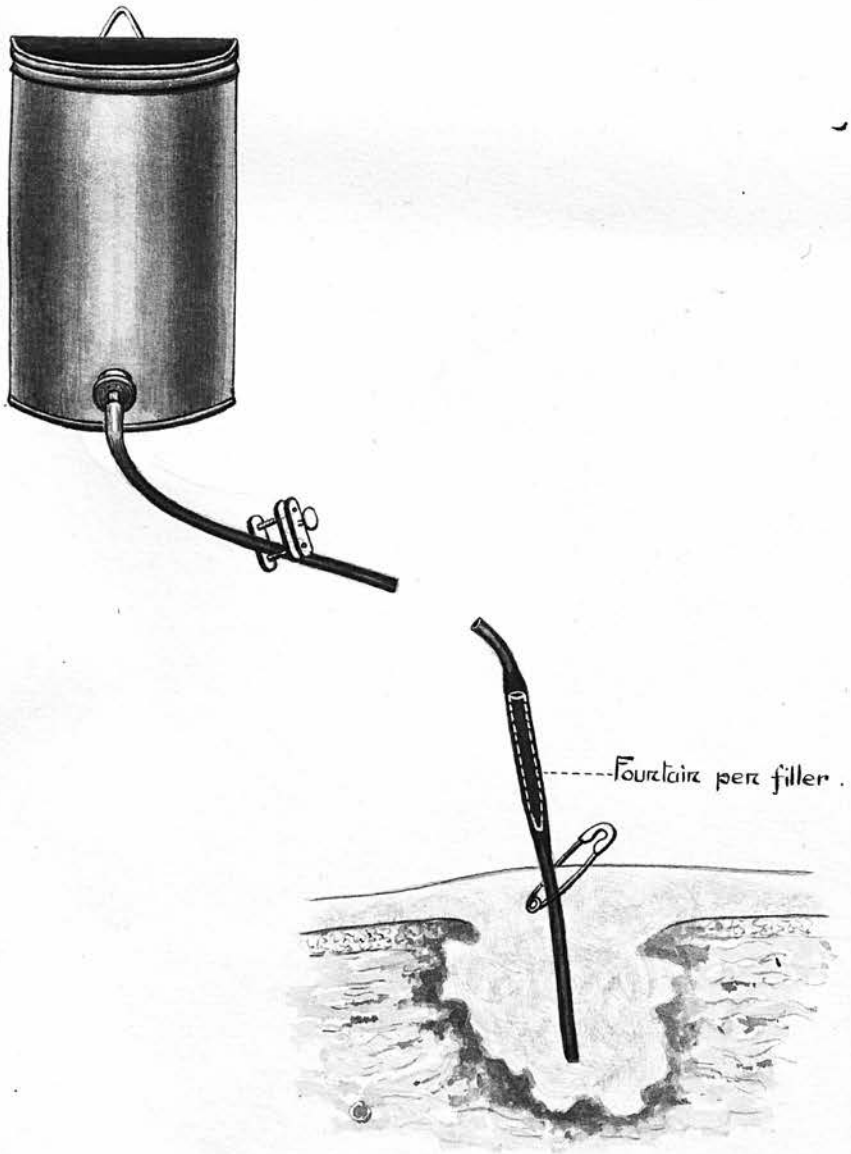
Although this modification may be preferred by some, I have neither found it so simple in its application, nor so efficient in its mode of action as the capillary apparatus.

It may be of interest to state that the two forms of apparatus above described were used in the Royal Infirmary in Edinburgh before the Carrel apparatus was introduced.

The above forms of apparatus have an advantage in that they can be improvised from materials which are readily obtainable.

The accompanying diagram illustrates a simple form of an apparatus which might be used for continuous irrigation, in which the principle of gravity only is involved.

DIAGRAM OF IRRIGATION APPARATUS (3rd Form).



VI.

BY MEANS OF AN APPARATUS FOR SECURING CONTINUOUS LAVAGE AND DRAINAGE, ETC.

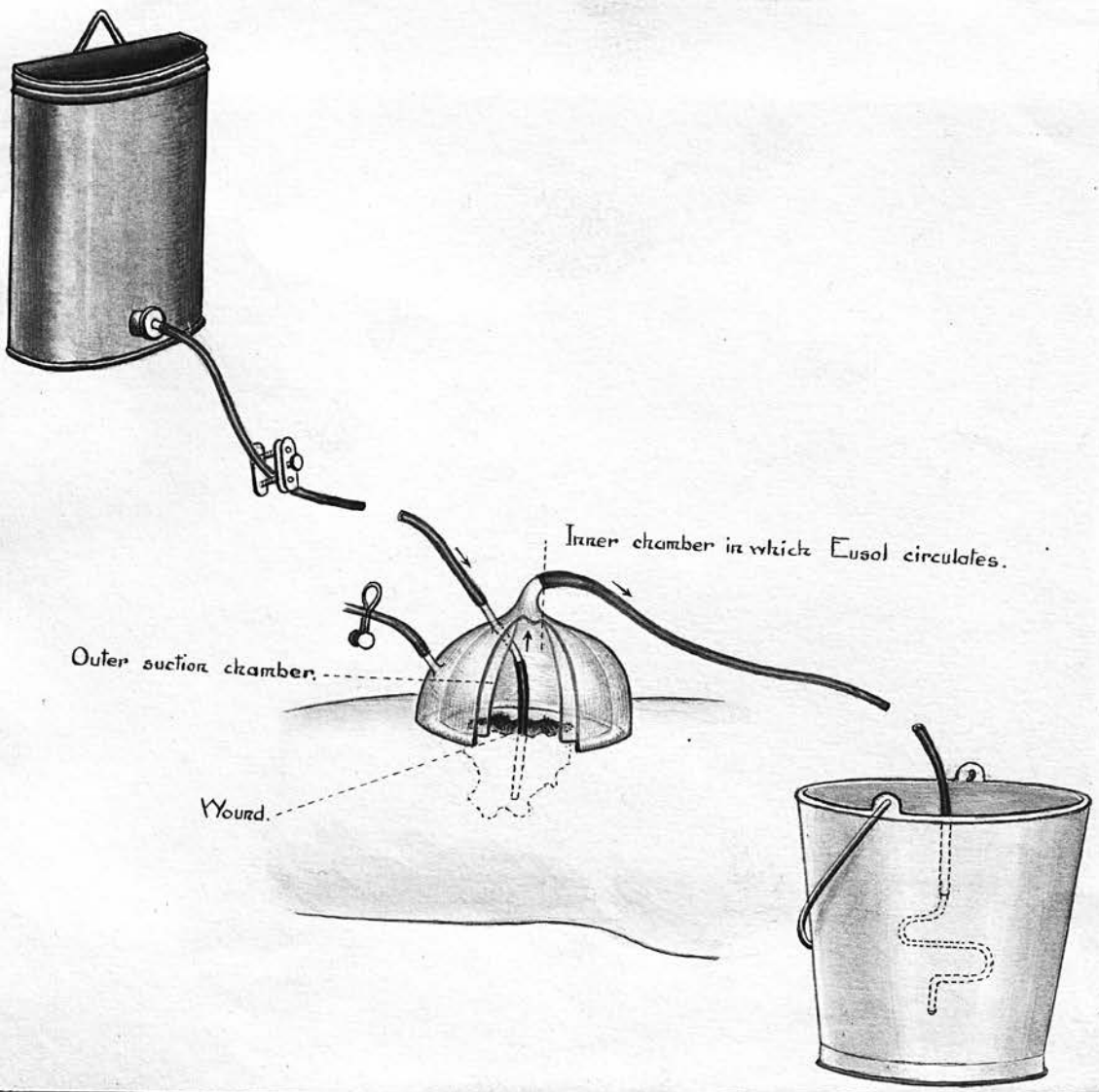
Having obtained, as I thought, some measure of success in treating wounds with Eusol by means of continuous irrigation, I was led to think that it might be possible still further to extend the method, at the same time attempting to include certain other fundamental principles of wound treatment, and it is with some diffidence that I submit the following, as being yet a generally practical method of application. I am aware that the method is not fully developed but, from the limited experience I have had of it, I am convinced that it can be elaborated into a system of real utility, as, in the few instances in which I have been able to apply it, the results have been such as to demonstrate its potentialities. Glass and rubber manufacturers being extremely busy owing to war exigencies, I was obliged for a time to use the instrument in a roughly improvised form, but latterly was able to obtain a single form made of blown glass which was manufactured for me by Messrs. J. Preston & Sons, Scientific Instrument Manufacturers of Sheffield. Hence its applicability has been limited, and it may be well to state that for an extensive series of experiments a variety of different shapes is desirable, and that the instrument should be made in moulds, and the material either of glass or rubber, or both combined. It will be seen that the method is quite rational in its conception, and from this aspect alone I venture to put forward a plea for further experimentation.

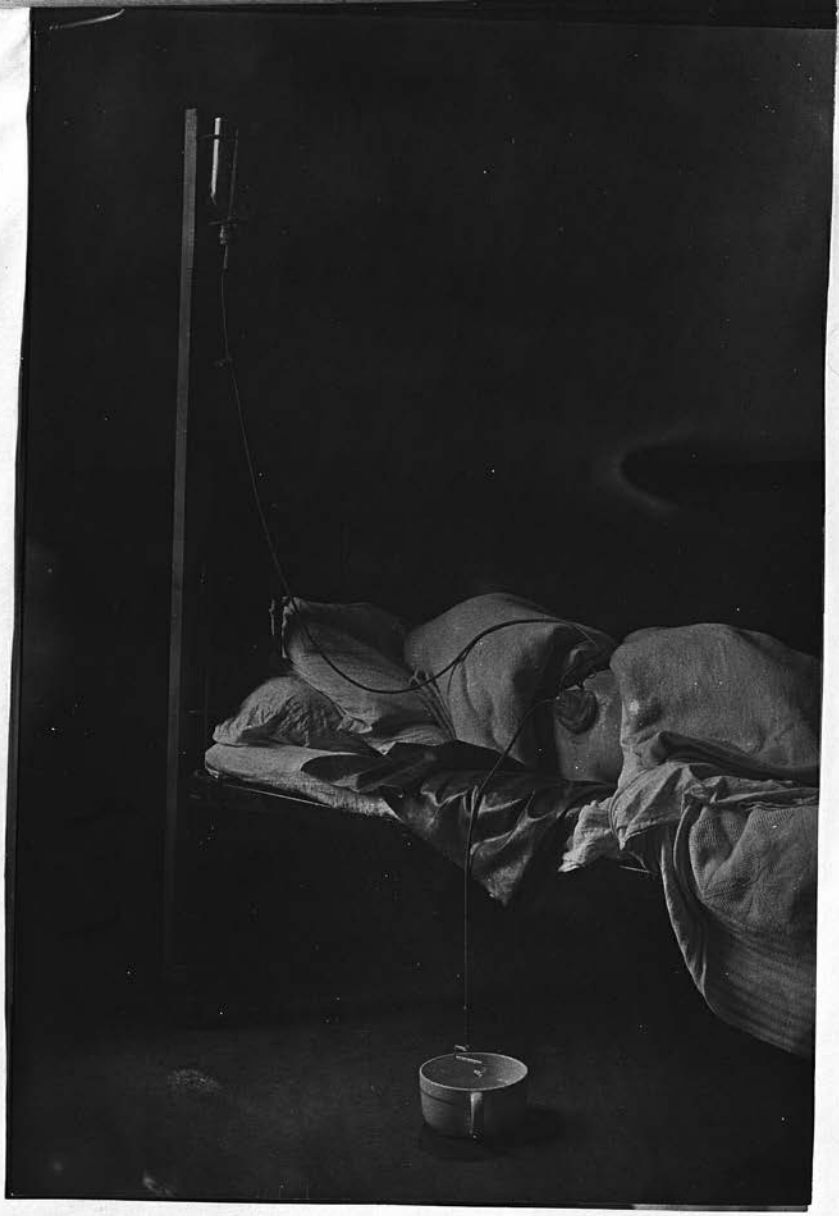
DESCRIPTION OF THE APPARATUS.

The accompanying diagram will be of assistance in following the construction and mode of action of the instrument.

It consists of an outer and inner chamber. The outer chamber serves as a means of fixing the instrument in position over the wound, this being accomplished by means of air suction, a glass tube being inserted in the outer wall for that purpose.

DIAGRAM ILLUSTRATING LAVAGE AND DRAINAGE APPARATUS.





The inner chamber, through which the Eusol solution is intended to circulate, is provided with inlet and exit openings. The inlet glass tube perforates the roof of the inner chamber and extends throughout half its depth. The exit opening is also in the roof of the inner chamber and is situated at the top of it. The measurements are appended to the diagram. The supply of Eusol is obtained from a reservoir which is connected with the inlet by means of a length of rubber tubing of suitable calibre, the rate of flow of the solution from the reservoir being regulated by means of a screw clamp affixed to the tubing. A suitable length of rubber tubing is also connected with the inlet tube inside the lavage chamber to ensure that the solution passes down to the bottom of the wound. A length of rubber tubing is attached to the exit, its free end being fitted with an S-shaped piece of glass tubing, the purpose of this being to prevent any backward suction of air when the apparatus is being applied.

ADVANTAGES OF THE METHOD.

Realising that in Eusol we are dealing with a powerful, non-injurious, and non-toxic antiseptic, our aim is to use it as freely as possible and in accordance with such other principles of wound treatment as will ensure the utmost benefit being derived from its application. In the treatment of septic wounds by this means all the chief principles of wound treatment are/

are observed, namely:-

(a) MECHANICAL CLEANSING OF THE WOUND SURFACES.

In most forms of wound treatment mechanical cleansing is only possible at such times as a dressing is being performed, and though there may be a fair amount of drainage, it is at the best imperfect, with the result that the wound surfaces and dressings are continually bathed in pus. By using this apparatus we are enabled to secure during the period of its application all the advantages of a continuous lavage.

(b) ANTISEPTIC ACTION OF THE SOLUTION.

This, in view of the other principles involved, I believe to be of special importance in this method of wound treatment, as, on account of the mechanical cleansing of the wound surfaces and the continuous removal of pus, the fresh warm solution obtains better access to the crypts which harbour bacteria.

(c) DRAINAGE.

As this is very efficiently performed by means of the apparatus we get rid of large numbers of bacteria and their toxic products, and so prevent the danger incurred through the absorption of the latter.

(d) LYMPH LAVAGE.

Eusol, having the properties of a saline solution, is capable of producing this phenomenon, but I believe that by combining it with an equal quantity of 10% saline a greater flow/

flow of lymph is produced from the wound surfaces. Moreover it is highly probable that, in view of the degree of hyperæemia produced by the application of the instrument and maintained while it is in use, the lymph flow may be still further increased.

(e) HYPERÆMIA OF THE WOUND EDGES.

When the instrument is applied a considerable degree of hyperæemia is produced, which is not merely restricted to the area of the skin subjected to suction but is very well exhibited by the skin surface in the lavage chamber, i.e.- in the immediate vicinity of the wound. Hence in the application of this method of continuous lavage we should in addition secure the advantages consequent on the presence of hyperæmia, e.g.- greater phagocytic infiltration and in all probability increased exudation from the wound surfaces.

(f) EXCLUSION OF AIR.

Certain pyogenic organisms being by choice aerobes, it is reasonable to suppose that deprived of their oxygen supply, their multiplication, virulence, and resistance to the power of the antiseptic should be diminished.

METHOD OF USE.

It has been my practice to use equal parts of Eusol and 10% saline solution, the latter being added with the object of increasing the flow of lymph from the wound surfaces. The temperature of the solution was about 110°F., and the period/

period of application did not exceed three hours. A douche-can forms a suitable reservoir and the warmth of the solution is maintained by the addition to it from time to time of fresh warm solution.

Sterile vaseline having been applied to the skin surface in the vicinity of the wound, and the inlet rubber tube having been inserted in the wound, the instrument is fixed in position by means of the pump of a Potain's Aspirator, the requisite degree of suction being maintained by means of a spring clip controlling the rubber tube attached to the glass tube connection of the outer chamber. Having fixed the instrument in position, we now attach the rubber tube leading from the reservoir to the inlet, and similarly, attach the drainage tube leading from the exit to a pail by the side of the bed. The solution may now be permitted to flow from the reservoir which is in position at some height above the bed, when the inner chamber is quickly filled, and as soon as the return fluid becomes quite clear the flow can be diminished by tightening the screw clamp. This should be so regulated that the return fluid should not exceed a rapid drop rate. If it be thought desirable to flush out the wound at intervals during the application, this may be done simply by releasing the screw clamp. The apparatus should have the protection of a cage to provide against the possibility of detachment by the pull of the bedclothes.

OBSERVATIONS ON CASES TREATED.

When in Edinburgh I had an improvised form of the apparatus made, and through the kindness of Mr. Miles, an opportunity was afforded me of using it in a case of appendix abscess. The results were very favourable. The patient, a boy of 13 years of age, had the instrument applied on the third day after operation, for a period of 2½ hours, and again on the fourth and fifth days for a similar period. On the sixth day, as there was no sign of pus and the wound edges showed evidence of granulation, I inserted secondary sutures and the wound closed up without further suppuration.

The second improvised form was improperly made and quite useless. The apparatus which I have described being only delivered to me shortly before I left Derby, I was unable to conduct a systematic series of experiments and therefore contented myself with applying it for about two hours in a few cases in order to ascertain that it worked properly, and in every case I noted a diminution in the flow of pus from the wound for the next day or two.

SUGGESTIONS FOR FURTHER DEVELOPMENT.

I have used this instrument only as a means of lavage and drainage, but it is clear that it is well suited for supplying an antiseptic in the form of a gas, and having this in view, I think that an ideal method of treating septic wounds would be by a preliminary lavage and afterwards by treating with hypo-

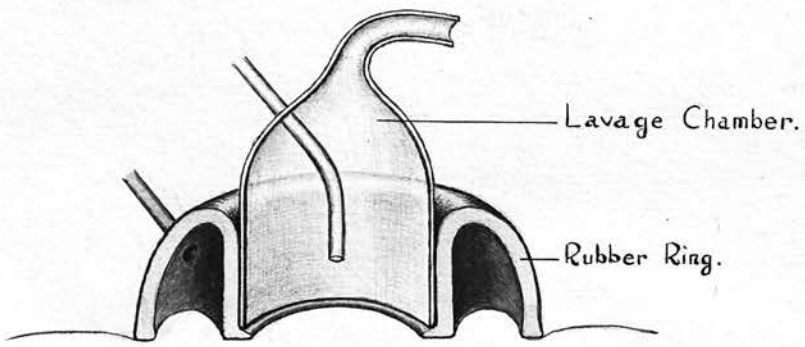
chlorous/

chlorous acid gas. A lavage might be carried out for about an hour and the instrument being removed and reapplied, the gas supplied from a generating chamber could be led into the wound and its presence assured in sufficient density by closing the exit opening. As Professor Lorrain Smith and his colleagues have stated that hypochlorous acid as a gas is a more efficient antiseptic than it is in solution, it may be well that, under some additional pressure, its penetrability and consequent antiseptic action will be increased, and that by a few applications of this form of treatment all organisms and their spores might be destroyed.

With regard to the form of the instrument it might prove of advantage to have the outer and inner chambers made separate. The inner chamber could readily be made to fit tightly into the outer chamber. The pressure on the skin would then be only exerted by the rubber rims of the outer chamber and would prove more adaptable, more comfortable, and less likely to become detached.

The accompanying diagram will indicate what is meant.

DIAGRAM OF SUGGESTED MODIFIED FORM OF LAVAGE APPARATUS.



VII.

ALTERNATE USE OF EUSOL AND POTASSIUM IODIDE PLUGS.

This is a method which I have adopted in the treatment of persistent sinuses, the rationale of the treatment being that irritation in a mild degree would be set up by the deposition of free iodine on the walls of the sinus, and the process of granulation so stimulated. By this means, in addition to the antiseptic action exercised by the Eusol we secure the antiseptic action of the iodine as well. It is probable that the particles of iodine are not merely deposited along the walls of the sinus, but that they are also to some extent deposited in the tissues in the immediate vicinity of the lining membrane of the sinus.

When treating cases in this way I have used Eusol in full strength and potassium iodide in a 40% solution, and thin strips of rolled gauze for purposes of application. It has been my practice to use in the morning a plug soaked in potassium iodide, and in the evening to employ Eusol in a similar fashion. Patients usually complain of a smarting sensation on the application of the potassium iodide solution, but this is not in any way excessive nor of long duration.

CASES TREATED/

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I have treated in this way two persistent sinuses and a tuberculous ischio-rectal abscess very successfully.

The first case was that of a soldier in whom a sinus in the groin following a shrapnel wound had persisted for a period of two months, without any sign of healing. There was a fair degree of discharge, a film of which shewed the presence of streptococci and staphylococci. The length of the sinus was about three inches and was in close proximity to the large vessels, the line of which it took upwards under Poupart's Ligament. The result was that the sinus was completely healed in fourteen days, from the commencement of the treatment.

The second case was also that of a soldier. He had received a bullet wound in the left lumbar region of the abdomen. An operation for the removal of the bullet had been performed in France. A sinus persisted in the wound. The infection was of the Bacillus Coli type. This was similarly treated and was completely healed in ten days. The sinus had shewn no perceptible sign of improvement during a month's treatment in the Infirmary until this treatment was adopted.

The third case was that of a civilian who had been in hospital for over six months suffering from an ischio-rectal abscess. The condition was evidently tuberculous and the discharge was profuse and offensive, due to the presence of the/

the Bacillus Coli. The sinus had been opened and scraped on three occasions, but shewed little if any tendency to heal. I opened and scraped the sinus and commenced the potassium iodide and Eusol treatment. In less than six weeks the sinus was practically healed and the patient was discharged, having been instructed to come to the Out-Patient Department and report. When I saw him a fortnight later the condition was most satisfactory. The sinus was then about one half inch in length and the discharge negligible. As he was told to come again if he had further trouble and did not reappear, it is to be presumed that healing was complete.

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